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ENVIRONMENTAL
RESOURCE

assachusetts Department of Natural Resources ARTHUR W. BROWNELL, COMMISSIONER September · October Number 1

THE NORTHWEST ATLANTIC FISHERIES CRISIS

Although the recent dispute between Soviet fishermen and American lobstermen off the Massachusetts coast has caused an avalanche of publicity, an even greater crisis with more far-reaching implications is taking shape in the Northwest Atlantic. In recent years these waters — particularly Georges Banks which lies 50 to 100 miles off Nantucket — have been so overfished that marine resources are dwindling rapidly.

Already haddock stocks, once the mainstay of the Massachusetts fishing industry, have been declared a resource disaster by the Federal Government. Herring and yellowtail flounder stocks in these waters are also on the verge of commercial extinction and other species such as cod, mackerel and lobsters are threatened. Unless some management and regulation of fishing in these waters is imposed immediately, valuable fishing stocks that now account for a good part of the $200 million annual catch in the Northeast will be wiped and the New England fishing industry ruined.

For years the Northwest Atlantic, especially Georges Banks off Massachusetts, has supported the bulk of fish landings such a haddock, cod, flounder, mackerel, herring — all of which substantially contributed to New England's economy and development. While volume of landings of specific species varied over the years, there was little indication of over-fishing and the abundant supplies of fish were believed to be inexhaustible.

In less than a decade the situation has changed radically. In the early 1960's the Soviets moved into these waters in large numbers, followed by other Communist Bloc and European nations. These government subsidized fleets consisted of everything from small, obsolete side trawlers to giant factory ships capable of complete servicing of the catching vessels. By 1970 the combined foreign fleets consisted of over 1000 vessels which spent at least part of the year in the Georges Banks area.

The scorecard on fish catches illustrates the dismal story. From 1952 through 1960 the U.S. fish catch from New England waters averaged over 700 million pounds, 99% of the total catch from that area. By 1969 the U.S. catch from these waters had declined to about 418 million pounds, 25% of the area's total harvest. In that year the Soviets took 836 million pounds, 50% of the total catch from New England waters.

The consequences of this fantastic increase in fishing effort are now becoming clear. One by one the most abundant and economically important species of fish have been systematically exploited by "pulse" fishing. Pulse fishing consists of directing intense effort to a particular fishery until it is no longer economically feasible to continue. When that point is reached the Soviet or other foreign fleet switches to another species and the exploitation proceeds again. After being so intensely exploited, it is questionable whether the species can adequately reproduce to replenish their diminished population. It is also questionable what the ultimate effects of over-exploitation will be on the total marine ecosystem. It is certain though that pulse fishing is like a dangerous, irresponsible game of Russian roulette in which the stakes are nothing less than the survival of valuable protein resources.

Ironically the most seriously threatened fishery resources are those which have been the most prolific. Only those species whose sheer numbers provide a huge source of available protein are sought by the Soviet Union and other foreign nations. Through fleet communications the catching vessels are homed in on fish concentrations after special scout vessels have systematically plotted their abundance. In this manner constant pressure is applied to the schools of fish as they go through their normal seasonal movements or migrations. No longer are the fish safe from capture. The fleets can trawl at whatever depth the fish are present. When coupled with electronic gear that pin point fish concentrations, the capability for virtual annihilation of each school is realized.

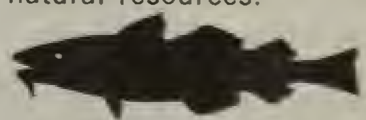
COMMISSIONER'S CORNER

Over the years the quest for economic prosperity and material progress narrowed our vision to a point where we lost sight of the environmental implications of our actions. Perhaps even worse, we failed to recognize the fundamental fact that our natural resources are limited and exhaustible. As a result of this myopia we are now paying the consequences: foul air, polluted rivers, despoiled land.

We can no longer tolerate the abuse of our natural resources. If we ever hope to improve the quality of life, now in a state of deterioration, we must act so as to have a benign rather than a malign impact on our environment.

As the state's environmental agency the Department of Natural Resources plays a leading role in fighting pollution and providing for parks and other recreational facilities. Its major task is to guide the actions of other organizations and individuals so that they will be compatible with the preservation of our environment. In this first imprint of the newsletter **Resource**, as well as in subsequent publications, the Department will be featuring environmental issues and DNR's involvement with them.

As shown in the lead-off story "The Northwest Atlantic Fisheries Crisis" our environmental problems are staggering. Indeed they are so gigantic that all our resources — natural, human and financial — must be wielded together to wage war against environmental pollution. It is this concept of total resource effort that has inspired the title for DNR's newsletter. It is the translation of this concept into practice that must be undertaken if we are to stand a chance in protecting the Commonwealth's natural resources.



The grim effects of pulse fishing are now being felt. In 1965, 550 million pounds of haddock were caught in the Northwest Atlantic. Of this catch the Russians accounted for 283 million pounds, most of which were young fish spawned in 1963, an unusually successful year for this species. This huge year class would have sustained normal U.S. haddock fishing into the 1970's and at the same time provided ample breeding stock for the future. But as a result of pulse fishing only 27 million pounds were caught last year — the lowest number ever recorded. So reduced are haddock numbers that the National Marine Fisheries Service has recommended that fishing haddock be suspended indefinitely in New England's waters. Many biologists believe there is a possibility that the species could disappear from New England waters in the next few years.

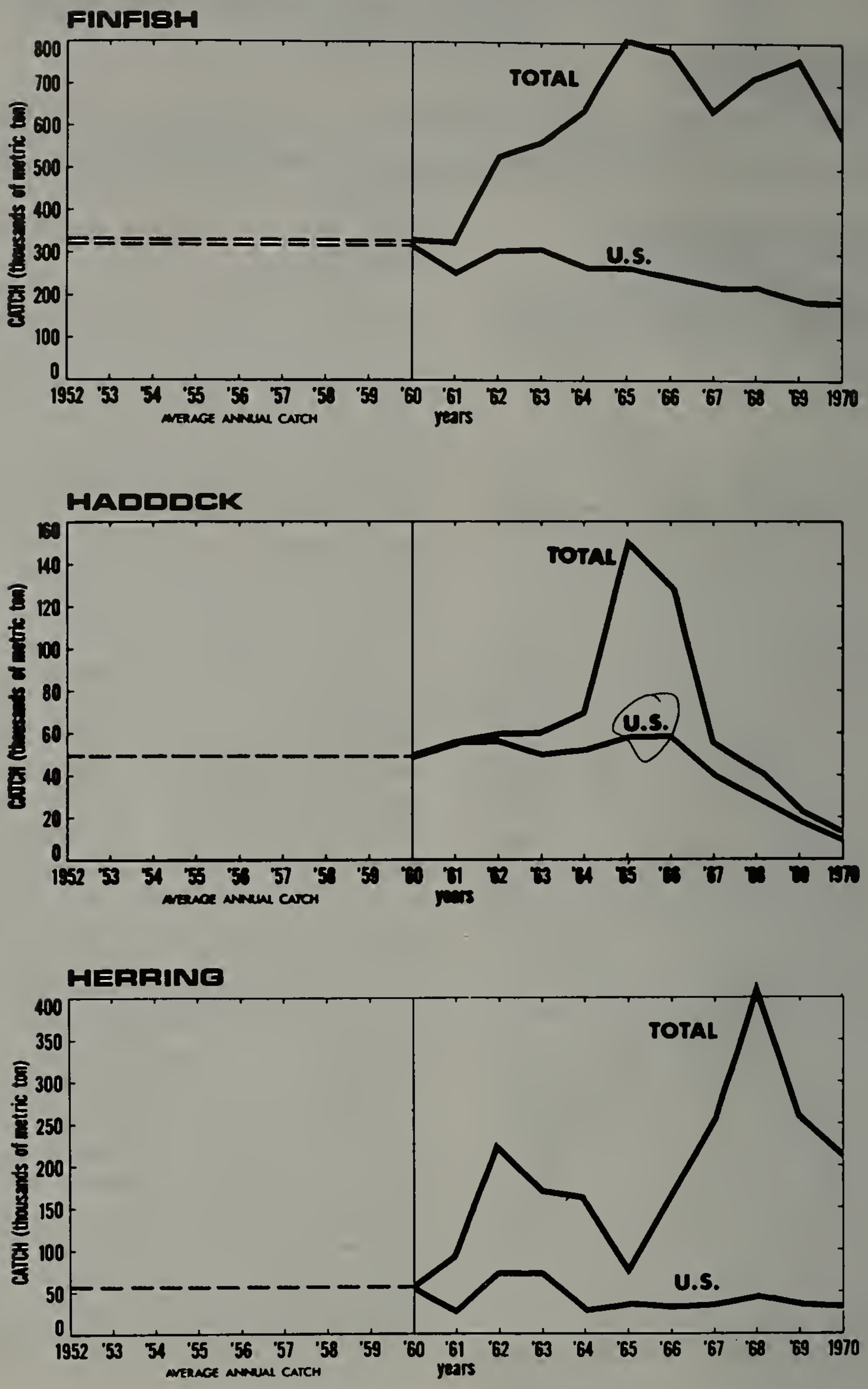
Nor is the situation much better in the herring fishery. In the spring of 1971 National Marine Fisheries estimated that the once abundant stocks of herring off the Atlantic coast had been reduced by 95% in just two years of intense fishing. And many experts predict that unless drastic conservation measures are taken immediately, the yellowtail flounder, cod, mackerel, sea scallops, lobsters and other abundant species will be imperiled.

At present the only control, treaty agreement or fisheries jurisdiction covering New England's waters outside the 12 mile limit is empowered in the International Commission for Northwest Atlantic Fisheries (ICNAF). Established in 1949, ICNAF consists of 15 member nations, including the U.S., Canada, and the Soviet Union, whose purpose is "to investigate, protect and conserve the fisheries of the Northwest Atlantic Ocean in order to make possible the maintenance of a maximum sustained catch from these fisheries."

Unfortunately ICNAF has been ineffective, an anachronism of less complicated times before pulse fishing and the advent of modern fishing fleets. Since its beginning ICNAF has been unable to develop an adequate system of fishing controls. As the case of haddock testifies — a species which ICNAF has concentrated its greatest effort in managing — the Commission has been incapable of acting in time to prevent the decline of a species. It only reacts after the tragedy has occurred. The international machinery is so time-consuming that it cannot hope to keep pace with the technological capabilities of the foreign fishing nations involved.

The fact is the Commission has not even addressed the real issue — *total fishing pressure*. Under ICNAF's species management approach it can only impose regulations on a particular species after it has been documented that the species has been over-fished. In actuality these regulations have come about after pulse fishing has already been transferred to another victim.

CATCH FROM NEW ENGLAND WATERS



Until some control can be exerted on the total harvest capability of the nations involved, no effective management will exist.

ICNAF's supporters point out that the Commission is now in the process of improving international procedures for achieving effective management of fish stocks. Presently ICNAF has a proposal for granting coastal states preference in traditional fisheries, but permitting other nations certain rights to utilize some of the stocks. But even ICNAF's most optimistic supporters admit that truly effective management is at least several years away — and that may be too late to save those endangered species.

It is evident that some form of management of New England's offshore waters is imperative. To achieve this as soon as possible, the Department of Natural Resources recommends that the Congress of the United States pass emergency legislation temporarily extending fisheries jurisdiction over these waters. Extended fisheries jurisdiction would not involve any territorial extension of 100 or 200 miles offshore. It is realized that such an approach would only invite reciprocal territorial extension on the part of other nations, closing off areas such as the Mediterranean and yielding little more than equalization of disadvantage plus hard feelings. Extended fisheries jurisdiction, however, would enable the U.S. to exert effective management over the area.

Medford residents fought the gypsy moth with brooms, dustpans, rakes, shovels, printer's ink, burlap tree bands, kerosene, and teakettles of boiling water. But in the early years of the battle their efforts were virtually useless. Trooping battalions — armies of worms — continued to march down the streets.

Today the gypsy moth causes thousands, and sometimes millions of dollars worth of damage each year. It is one of the most destructive insects currently attacking forest and shade trees in the northeast. Most susceptible to defoliation in Massachusetts are oaks, but birch and beech, as well as pine, hemlock and spruce in mixed stands, are also seriously affected.

Most deciduous trees can withstand one or two defoliations. Some trees can take even more punishment because they will usually sprout new foliage by mid-summer after stripping has occurred. But nearly all conifers, especially hemlock and spruce, are killed by a single complete defoliation. Even when defoliation fails to kill trees damage is often severe. Trees stripped of their leaves or needles grow at a reduced rate if they grow at all. Defoliated or dead trees also mean a dry forest — increasing fire and rapid water runoff hazards, affecting stream flow, destroying wildlife habitats, and reducing land and recreational values. Massachusetts has lost millions of dollars in tourist revenue because of repeated gypsy moth defoliations.

The gypsy moth phenomenon in the United States is one of the most fascinating in entomological annals. Deservedly the insect bears the epithet "gypsy." A roamer, the gypsy moth is disseminated in the early larval stage during the critical May period. Young caterpillars, light as dandelion seed parachutes, are updrafted by the wind as high as 2000 feet, and, depending on air currents, blown more than twenty miles away. Long-distance vagabondages are accomplished primarily during the egg stage in July and August when gypsy moth egg clusters are transported on boxes, crates, freight cars, automobiles and trailers, lumber, quarry stone and debris.

Considering the reproductive capacity and mobility of the gypsy moth, it is not surprising that in a single year thousands of acres can be defoliated. In recent years the hardest hit area in Massachusetts has been Cape Cod (Barnstable County). But gypsy moth infestations are also showing up now in Norfolk, Bristol, and Hampshire counties. In 1970 between 7000-8000 acres were defoliated. Reliable estimates now indicate that approximately 25,000 acres will be defoliated in 1971 and 100,000 in 1972. And the gypsy moth is spreading to other states as well. New York, New Jersey and Pennsylvania have already experienced severe gypsy damage and minor gypsy outbreaks have occurred as far away as Michigan and Florida. Next year it is probable that serious infestations will harass Delaware and Maryland.

Sad nudity: stark evidence of gypsy moth defoliation

Many uninformed people place the blame for gypsy moth damage on the 1969 ban imposed by the Massachusetts Pesticide Board on such hard or persistent pesticides as DDT, DDD, dieldren, toxaphene and heptachlor. But the fact is that gypsy moth infestations run in cycles, hitting a peak about every seven years. The last major outbreak occurred in 1963-64 when some 250,000 acres were defoliated. In peaking in 1971-72 the gypsy moth is simply operating on schedule. Even if DDT could have been used in 1970 it would have had little impact on the massive gypsy moth population buildup. And this past June the aerial spraying of Nickerson State Park in Brewster with Gardona (a nonpersistent insecticide which breaks down three days after application) was only partially successful because of the enormous numbers of caterpillars and the lateness of the application. In peak periods the most effective gypsy moth control is the environment's own built-in biological elements, particularly a virus which knocks the moth down naturally. This virus is transferred from the female moth to her eggs but it manifests itself only when the population is imperiled by overcrowding and starvation.

The Bay State is plagued not only by the exotic gypsy moth but also by such native pests as the saddled prominent, the oak leaf skeletonizer, the pine looper and the Nantucket pine tip moth. What they have in common is that they are all moths, they are destructive only in the caterpillar (larval) stage, and they peak periodically at fairly regular cyclic intervals.

The Cape hosts many of these insect pests, among them the pine looper and the Nantucket pine tip moth which attack pitch pine. Last fall the pine looper ate its way along thirteen miles of road in Wellfleet and Eastham leaving behind a brown swath visible from the Mid-Cape Highway. It is anticipated that pine looper will defoliate several thousand acres this year and kill a great many pitch pine.

But other parts of Massachusetts have not been spared devastation from caterpillars either. In 1970 alone the saddled prominent stripped nearly 100,000 acres of birch, beech and hard maple in Berkshire County and the oak leaf skeletonizer defoliated large oak populations in Middlesex and Essex coun-

At present under ICNAF some control is attempted through regulating net mesh sizes and fishing quotas. But these regulations are difficult to enforce, requiring the boarding of vessels to check on compliance with the law. By extending fisheries jurisdiction the Federal Government could control fishing quotas by determining the number of vessels fishing the area. Enforcement would be feasible as the Coast Guard could monitor the number of vessels entering and fishing the area at a given time. In this way the critical pressure on fish supplies could be controlled and reduced.

Other immediate steps can also be taken to protect marine resources, specifically in the case of lobsters. The U.S. claims control over the oil, minerals and all "creatures" of the Continental Shelf. Permission to extract any mineral or creature from the nation's seabeds must be granted by the Federal Government. Presently lobsters are not classified as "creatures" of the Continental Shelf. Yet there is precedence for doing so since all of the West Coast king crabs, similar type crustaceans as the lobsters, have been classified "creatures" — an arrangement, incidentally, which the Soviet fleets have honored. If National Marine Fisheries extended classification to lobsters, a vital sector of New England's fishing industry could be protected.

The time is ripe for the Commonwealth to apply pressure on the Federal Government to extend fisheries jurisdiction to these waters. In the past the Federal Government has looked upon the Northwest Atlantic fisheries as poor cousins among the nation's fishing industries. In the arena of international politics the Government has appeared to have written off New England's fisheries as an unimportant factor for consideration. But now the Northwest Atlantic fisheries appear to be gaining influential allies that could aid in convincing the Government to extend fisheries jurisdiction. Both the West Coast and Gulf Coast fisheries, segments of which previously opposed any extension of fisheries jurisdiction, are now changing their attitudes toward this policy.

Undoubtedly the Federal Government, not wishing to antagonize its neighbors, would prefer to extend fisheries jurisdiction on a bilateral basis with the Canadian Government rather than alone on a unilateral basis. Canada might be very receptive to a bilateral approach given its similar fishing interests. Nevertheless if Canadian cooperation is not immediately forthcoming, action to extend fisheries jurisdiction should be carried out unilaterally since the need for protection is so urgent.

The crucial point is that we must make a total effort to impress the Federal Government with the urgent need to address itself to the critical problem of protecting these fishery resources. At the present there is a bill before the Massachusetts Legislature to extend the territorial waters of the Commonwealth 200 miles from the shoreline. We support the intent of this bill in that it seeks to protect our offshore fishing industry. While we realize that the bill may be unconstitutional, we believe that lack of appropriate action disregards an even more fundamental law — that of conserving our living resources.

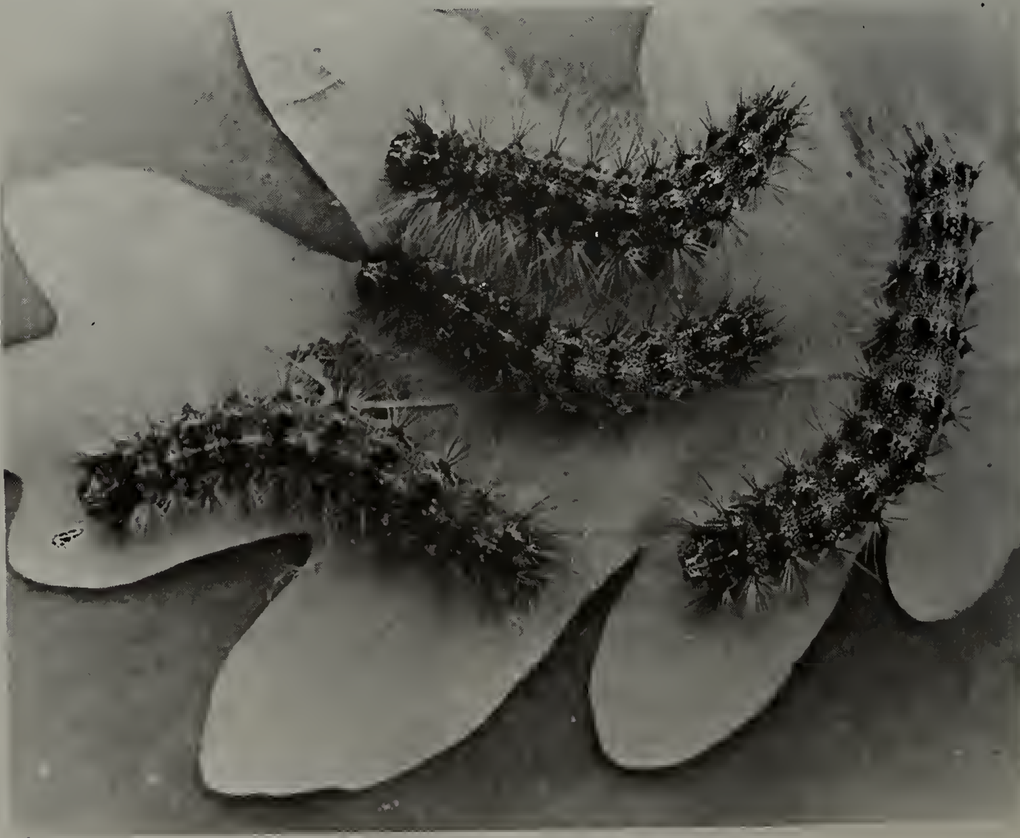
Our strategy thus should be to exert pressure on all fronts and on both Congress and the Executive branch to press for emergency legislation. But time is of the essence, for unless we move quickly to enact effective control over our fish resources, an ecological disaster may occur that will not only ruin New England's fishing industry, but wipe out a vital food resource for the entire world as well.

THE DEFOLIATORS: OUR CATERPILLAR CROWD

Twenty-seven Myrtle Street, Medford, Massachusetts, may not be as familiar as London's No. 10 Downing Street or Sherlock Holmes's 221B Baker Street but it holds a place, however dubious, in history. In 1869 Leopold Trouvelot, a French scientist temporarily residing in Medford, imported gypsy moth egg clusters from France. His idea was to cross the tough gypsy moth with the silkworm moth, thereby developing a hardy race of disease-resistant silk producers. Although the mist of legend has enveloped the whole gypsy moth episode, evidence suggests that the moths escaped from Myrtle Street when a windstorm blew them off Trouvelot's laboratory window. This was the beginning of the gypsy moth infestation in the United States.

At first the new and changeable climate, brush fires, and the vulnerability of this exotic species to predatory insects and birds combined to retard gypsy moth's spread. But the reproductive powers of the gypsy moth are enormous. (It has been calculated that, without natural controls, the unrestricted increase of a single pair of gypsy moths would be so great that the progeny could devour all vegetation in the United States within eight years.) Twelve years after its introduction into Medford the gypsy moth had become a serious nuisance to people living near the Trouvelot house. By 1889 it had extended its territory to include thirty townships — some 240 square miles.

Contemporary accounts of the disastrous 1889 gypsy moth outbreak read like a film scenario directed by Alfred Hitchcock. The caterpillars were not only seen, they were heard, felt, and smelled. They covered the roofs and sides of houses, clung to screen doors, stained washing on the line, and invaded people's closets and beds. They pattered on sun umbrellas and dropped down the turned-up coat collars of commuters fleeing up the middle of the street to the Glenwood station. In the warm, still summer nights a sickening stench arose from the masses of caterpillars and pupae in the woods and orchards and a constant shower of excrement fell from the trees where the caterpillars were voraciously feeding.



Close-up of gypsy moth caterpillars feeding on oak leaf ties. For the past two years the saddled prominent has extended its territory into Franklin and Hampshire counties and the oak leaf skeletonizer has invaded Norfolk and Bristol counties.

Any attempt to control or eradicate insect pests invariably raises the controversial question of spraying or not spraying pesticides. For many people the temptation is loudly to shout "Yea" or "Nay." But reason suggests that neither extreme is desirable at this time.

Nature offers some checks on the proliferation of these insect pests. A European species of the Calosoma beetle, intentionally introduced into New England to combat the gypsy moth, feeds on all kinds of lepidopterous larvae, and mice and shrews eat the pupae of the gypsy and saddled prominent moths. But such biological controls are inadequate — man has to take a hand himself because, in relation to the insect world, he is both outnumbered and outproduced.

In the past, however, man's hand has been heavy on the release trigger, misting the landscape with the noxious vapors of pesticides year after year, slowly poisoning the environment. Today the state follows a more discriminate approach to pesticide use, and the Department of Natural Resources, the Commonwealth's environmental agency, sprays only where insects and people come together in recreation and residential areas. What is left of wilderness lands will remain untouched.

DNR's policy of judicious spraying reflects an awareness that we are between two worlds — the present and the future. However much we may long for the simplicity of less complicated times, it is gone forever. As Charles S. Hood, Chief of the Bureau of Insect Pest Control and advocator of discriminate pesticide use puts it: "We cannot return to the past, particularly the past that had the farmer planting three hills of potatoes — one for the woodchuck, one for the bugs, and one for himself. Economics, if nothing else, would rule against this. Although problems do arise from the use, or more aptly the misuse of pesticides, their application must continue where alternative methods are inadequate or have not been developed. Without pesticides New England would soon lose its national and international reputation for food and fiber production, tree-lined villages, and recreation."

The hope, of course, is that effective alternatives to pesticides will be developed in the next few years. Experiments are already under way to control gypsy moths by chemical sex attractants and sterilization of male gypsy moths. Meanwhile, until some effective means of control is found, the caterpillar defoliators will continue to defile our landscape.

FOSTER SWORN IN AS SECRETARY OF ENVIRONMENTAL AFFAIRS

On August 3, 1971 Charles H. W. Foster was sworn in as the first Secretary of Environmental Affairs in Massachusetts. Appointed by Governor Francis W. Sargent to be a member of his Cabinet, Secretary Foster is well qualified to serve as overseer of the Commonwealth's natural resources.

Recipient of a B.A. in English from Harvard College, Mr. Foster was later awarded a B.S. in forestry from the University of Michigan, a M.S. in wildlife management from the University of Michigan, and a Ph.D. in geography and environmental engineering from Johns Hopkins University. In addition to his substantial academic background Mr. Foster also brings to his new job wide practical experience with environmental matters. His job experience includes working for the U.S. Forest Service in Oregon; consultant, Massachusetts Water Resources Commission; Commissioner (1959-1966), Massachusetts Department of Natural Resources; President, Nature Conservancy in Washington, D.C.; Chairman of the board of trustees of the New England Natural Resources Center in Boston.

THE BATTLE TO SAVE THE MARSHES

For many years Massachusetts' coastal marshes have been vanishing becauses of land developments. In one decade alone, 1954-64, more than 1000 acres of the state's 45,000 acres of coastal wetlands disappeared.. Few persons, however, were alarmed at this appalling rate of destruction. After all, so the prevailing attitude ran, salt marshes were little more than foul-smelling, mosquito-breeding wastelands. More important, the land was needed for housing, waste disposal, parking lots and roads.

Then, as the public became increasingly aware of the need to preserve coastal wetlands, the state in 1963 passed the Jones Act, regulating the dredging and filling of marshes, and two years later the Coastal Wetlands Act, restricting wetland uses. Today the battle to save coastal marshes is not over, but it is well on the way to being won.

Much of the success in protecting tidal marshes has been due to the Jones and Coastal Wetlands acts. Massachusetts is well ahead of other states in coastal wetlands legislation. Maryland, for example, has just passed a coastal wetlands act and Connecticut has a law on the books, but as yet not one acre of salt marsh has been protected.

Under the Jones Act a developer is required to obtain a permit to fill or dredge a salt marsh; he is prohibited from any development that would affect the survival and reproduction of marine life. More regulatory authority was granted DNR with the Coastal Wetlands Act. While the Jones Act is essentially stopgap legislation designed to put a temporary restriction on dredge and fill operations, the Coastal Wetlands Act is intended to guarantee permanent protection to salt marshes found by DNR to have high natural resource potentials. As DNR's Director of Conservation Services George R. Sprague puts it, "The Coastal Wetlands Act allows us to lock the door before the horse is stolen from the barn."

So far 18,000 acres of coastal wetlands are under some kind of protection against development; more than 10,000 acres have restrictions on development pending, leaving 17,000 acres still to be covered. DNR's Division of Conservation Services, which administers the Jones and Coastal Wetlands acts, is moving to extend protection to a large portion of this remainder. This summer public hearings on wetlands were held in Eastham, Orleans, Chatham and Harwich. "The Cape," says Director Sprague, "has the largest stretches of unprotected wetlands remaining — so we're concentrating our efforts there now."

Even more important than legislation in the battle to save the wetlands has been an environmental awakening in the last few years — a realization by the public of the value of preserving salt marshes. Not only are these marshes irreplaceable habitats for many species of plant and animal life and an abundant food source supporting vast fish populations, they also provide a buffer zone between land and sea. In a storm, marshes help prevent both costly flooding from upland areas as well as severe damage from ocean waves.

Towns up and down the coast whose wetlands are still unprotected are now clamoring for public hearings. In many cases public hearings already held have aroused towns to action. Ipswich blocked a proposal to build an atomic power plant in the marshes. Scituate passed a local bylaw restricting usage after witnessing the cumulative effect of marshland destruction by a series of dredge and fill operations. Marshfield passed restrictions too after discovering that years of garbage waste and oil leakage from pleasure crafts spilling into the salt marshes had polluted the shellfish beds.

Economic pressures to develop land for summer cottages, docks and marinas persist, however. Pockets of resistance to marsh preservation still endure, especially around Boston where the value of land for housing is high. Nevertheless, Director Sprague estimates that within three years all the remaining wetlands on the coast, from Salisbury to Westport, will be protected. If so, Massachusetts will be not only the first state to pass wetland protection laws, but also the first truly to protect all its coastal wetlands.

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ON THE DOCKET

The following are major environmental bills now under consideration in the Massachusetts legislature:

MASSACHUSETTS ENVIRONMENTAL POLICY ACT — Filed by Governor Sargent, the bill seeks to insure that no major state project significantly affecting the environment will be undertaken until after full disclosure of the environmental effects of the project are reviewed.

SOUTH CAPE BEACH BILL — Calls for appropriation of about $3 million for the Department of Natural Resources to purchase South Cape Beach in Mashpee, the last warm water beach on the south shore of Cape Cod.

WETLAND PRESERVATION BILL — Authorizes $5 million for the Division of Fisheries and Game to purchase wetlands throughout the state. Under existing laws the state can restrict the uses of wetlands. The bill would help to permanently preserve wetlands through outright acquisition.

PHOSPHATE BILL — Calls for ban throughout state on sale of many detergents containing phosphates. While not a complete ban (some phosphates will be permitted), bill would affect about half the detergent manufacturers selling in the state.

CITIZENS' RIGHTS OF ACTION BILL — Enables individuals to take to court polluters who are violating existing antipollution laws. Only Michigan has such a law currently on the books.

SCENIC RIVERS BILL — Empowers DNR to act to preserve portions of rivers classified as scenic, recreation or wild river areas.

SCENIC TRAILS BILL — Calls for the Public Access Board to establish and coordinate plans for a system of recreation and scenic trails throughout the Commonwealth. Under this law state agencies, counties and local governments would have to consider trail systems in any highway or utility corridor proposal.

MINERAL RESOURCE BILL — Designed to conserve mineral resources off the Commonwealth's coast, the bill places a moratorium on all marine mining until such time as DNR obtains information on the quantity and quality of mineral resources available and the ecological implications of marine mining. (Bill has been passed and signed.)

EXTENDED FISHERIES JURISDICTION BILL — Emergency law extending state's control over waters as far as 200 miles off the Massachusetts coast. Purpose of bill is to provide management of marine resources that are now being overfished, thereby preventing further depletion of valuable commercial fish stocks and averting an ecological disaster.

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ssachusetts Department of Natural Resources Arthur W. Brownell, Commissioner November · December Number 2

CAN THE CHARLES RIVER BE CLEANED UP?

Over 120 years ago Henry Wadsworth Longfellow, in his poem "To the River Charles," extolled the clarity and purity of the Charles in such descriptive terms as "wave of blue" and "celestial hue." By the 1890s, however, a suffocating stench wafted over from the mudflats; the mouth of the river had become polluted and was a health hazard. Today nearly the entire 80-mile river — from Boston Harbor to the town of Milford — is to some extent polluted by industrial, solid and human wastes.

From the late 19th century on, occasional attempts were made to purge the Charles and revive it. And with good reason — for the Charles River has been the pride of Massachusetts ever since Captain John Smith discovered the river in 1614 and named it after Charles I of England. In early times the river served as a base for agriculture and the manufacturing of such diverse products as saw blades, snuff and chocolates. Today, as it meanders past modern space-age plants, handsome estates, suburban homes, the world-famous halls of Harvard and MIT and the skyscrapers of Boston, the river drains a valley encompassing 307 square miles, 35 communities and nearly 850,000 people.

But efforts to clean up the Charles were sporadic. It wasn't until 1966, when the legislature passed the Massachusetts Clean Waters Act establishing the Division of Water Pollution Control under the Department of Natural Resources, that a concerted and continuous program was put into effect. Water Pollution Control's job is to classify the quality of the state's waters and implement and enforce schedules for communities and industries to build waste treatment plants. Top priority was assigned to the task of seeing what could be done to improve the water quality of the Charles River.

Admittedly, progress in reversing the deterioration of the Charles has been slow. As Alfred F. Ferullo, environmental bio-engineer with Water Pollution Control, puts it: "Our early optimism in cleaning up the river has waned. When we started to study the problem in 1967 we had no idea of the degree of pollution and the time it would take to clean up the river."

In fact though, as Ferullo also points out, most of the river is on the verge of showing visible signs of improvement. The really troublesome portion, the part which is most heavily polluted, stretches only 8 miles from Watertown Dam to Boston Harbor. In the upper valley and middle portions of the Charles the water pollution problem appears to be under control. The major polluters — municipalities and to a lesser extent industries — are under orders to construct sewage treatment plants, upgrade existing treatment facilities or stop dumping waste into the Charles.

The towns of Franklin and Medway, for example, spurred on by federal-state grants that reimburse communities up to 80% of the costs for constructing sewage treatment plants, are now studying a plan to build a new plant serving both towns. In 1967 Cliquot Club Corporation in Millis was found to be dumping into the river 1480 pounds per day of organic sugar wastes that deplete tremendous amounts of oxygen from the river — oxygen desperately needed to provide a balanced aquatic environment. Now the company is cooperating in a pilot study to determine whether its industrial wastes can be treated in Millis' new pollution control facility.

Cleanup of the middle portion of the Charles — from Dover to the Watertown Dam — is also making headway. Up until recently municipal dumps situated near the river were major sources of pollution. Now cities such as Newton and Waltham are taking steps to prevent dump wastes from leaching into the Charles.

The key, however, to the cleanup of the upper and middle portions of the river is the reduction of algal populations. Algae are unsightly and stink. In excessive quantities they use up the river's oxygen supply, causing fish to die. In the Needham area the river is actually green from algal growth, and at times other upper and middle portions of the Charles look like stagnant green ponds. Flowing into the Charles are fertilizers, detergents carried by sewerage, human and other wastes containing nitrates and phosphates — all nutrients on which algae feed and multiply. New treatment plants under construction will

Turn of the century: Sunday on the Charles

Photo Credit: Boston Public Library

include nutrient removal processes which should eventually rid the river of excessive algae.

Under this concerted program Water Pollution Control predicts that a considerable part of the pollution in the upper and middle portions of the Charles will be eliminated next year and that by 1975 these portions will be upgraded to either "B" quality classification, meaning the water will be good enough to swim in, or "C" quality — water suitable for boating, fishing and aesthetic enjoyment. Says Ferullo, "Cleaning up the upper and middle Charles is just a matter of time, but it will be done."

Predictions for reducing pollution in the Charles River Basin, however, are somewhat more cautious; because this 8-mile stretch from Watertown Dam to Boston Harbor is more heavily polluted, the cleanup job is more formidable. Besides abundant algae feeding on phosphates and nitrates carried down from upstream, some of the basin's bottom is lined with black oozy sludge deposits emitting the rotten egg smell of hydrogen sulfide. Oil spills and floating debris such as orange peels, plastic bags, tires and cans are often present. Some water samples taken at Longfellow Bridge have contained salmonella bacteria, agents of typhoid fever.

In the lower basin the pollution picture is complicated by salt water entering through the sluice gates, open locks and corroded lock gates. Ordinarily the flow of a river enables oxygen to permeate down to the bottom. But here, since salt water is heavier, it settles below the fresh water, stratifying the river. With the fresh water flowing over the stagnant salt water, life-giving oxygen is prevented from moving downward to the bottom and foul gases are released to the surface. At low tide the river's mouth downstream from the dam at Leverett Circle is a virtual cesspool where no fish, and few animal organisms can survive.

The worst pollution of the basin is from human wastes. Older sections of the metropolitan area, such as Cambridge and Boston, have combined sanitary and storm sewers. Whenever flows exceed the capacities of the sewers — which happens in virtually every heavy rainfall — the storm water, along with the raw sewage, overflows through conduits into the Charles. Into the basin about 40 overflows empty untreated human wastes from the most densely populated area of Massachusetts.

A major effort to reduce pollution in the basin is being made. The Metropolitan District Commission, which operates the water supply and sewerage system for a large part of Greater Boston, has already spent over $130 million for cleanup, much of this for relief sewers designed to catch some of the overflows. In operation since last summer is a storm detention and chlorination facility near Boston University Bridge which should significantly reduce the frequency of untreated overflows, hopefully to as little as one overflow in five years. Consisting of six tanks which together hold over one million gallons from a single overflow, this facility can skim and screen sludge and chorinate the overflow before discharge into the river. The sludge and screenings then go to the MDC treatment plant on Deer Island.

A stretch of clean water in Needham

Photo Credit: M.A.P.C.

Perhaps most crucial to reducing pollution in the basin is the plan for constructing a dam at Warren Avenue, under the direction of the U. S. Army Corps of Engineers, and a nearby pumping station under MDC supervision. The project will help flush out wastes from Boston's overflows as well as reduce saltwater intrusions into the basin. By 1976, when the dam and pumping station are completed, the Charles Basin should show a marked improvement.

Just what the level of improvement should be, however, is a matter of opinion. Many groups — including the MDC, Boston League of Women Voters and the Charles River Watershed Association — would like to raise the quality of water in the basin to "B" level — water clean enough for swimming. But the Division of Water Pollution Control believes this goal is unrealistic at this time. The Division feels it will be a major accomplishment just to attain "C" quality level — water suitable for boating, fishing and aesthetic pleasure.

Several proposals have been made for raising basin water to "B" quality level. One is called the "deep tunnel plan." This involves collecting all the combined storm flows, discharging the waters into rock tunnels dug out beneath Boston Harbor, conveying the water to Deer Island where it would be chlorinated, and pumping it nine miles out into Massachusetts Bay. The plan is ideal except for the fact that the $500 million cost is prohibitive.

A second proposal involves separating Boston's combined sewer system into single-purpose sanitary and storm conduits; this dual system would be especially helpful in handling overflows into the Esplanade section of the basin. The weakness of such a plan, as several sanitary engineers point out, is that the costs of installing an entirely new system of sanitary pipes, plus new plumbing systems for Boston's buildings, would exceed $100 million — again too prohibitive.

A third proposal — one which most proponents of "B" quality (swimming) water favor — is called the Charles River Reclamation. Basically this plan involves in-stream chemical treatment, perhaps near the Watertown Dam, which supposedly would transform the Charles into "near drinking water clarity." The project also calls for improved management of combined sewers bordering the basin and the dredging of a small barrier at the bottom of the basin near Longfellow Bridge to enable better outward flow of salt water. The construction cost could be as little as $3 million.

Water Pollution Control, however, does not consider this a practical solution at this time. The Division feels that it is inconsistent to try to upgrade water to swimming quality while the basin remains polluted by heavy overflows. More to the point, the Division believes in "first things first" — get the water quality of the basin up to "C" — suitable for boating, fishing, and aesthetic pleasure. Hopefully the various projects under way will do the trick. But as Ferullo ground: from low-income family with parents divorced or separated; offense: armed robbery or breaking and entering; time behind bars: seven to ten years. For most of his life he has lived in a city — Boston, Springfield, Worcester, Lynn, Lowell, New Bedford — to which he returns after his seven-nine month stay at a camp.

The most effective element in the rehabilitation of prisoners at a camp is the relatively normal atmosphere in which the inmates live and work. There are no barred windows, locked doors, high walls, watchtowers and searchlights to intensify the feeling of being a caged animal. The men work an eight-hour day, five days a week. Under the supervision of DNR personnel they spend their work day constructing recreational facilities and roads and improving the commercial and aesthetic value of the state forests and parks. In the evenings and on weekends they can participate in various sports, attend vocational classes, study for school credits or relax. When their families visit on weekends they can meet anywhere on the camp grounds without a guard being present. At Myles Standish State Forest inmates frequently picnic with their wives by the side of a quiet pond.

To be sure, correctional guards are around and observant all the time. But unarmed and without uniform, they are inconspicuous. There is little to prevent prisoners from escaping except for the fact that their prison terms are nearly completed and a break, or attempted escape, could mean an additional stretch up to ten years. As a result, only one percent of the total camp inmates walk away each year. More important is the opportunity the camps afford for prisoners to adjust to the world outside. While forestry camps are far from being a panacea for rehabilitation, records show that camp inmates are less likely to run afoul of the law again than prisoners who have served out their full sentences in maximum and medium security prisons. The recidivism rate for forestry camp inmates is about 34 percent while that for Walpole-Norfolk-Concord inmates is nearly 44 percent.

For the Department of Natural Resources forestry camps have been a boon, much as the Civilian Conservation Corps camps were in the 1930s. It was Massachusetts' 10,000 CCC men who made extensive improvements in the state's forest and park lands: they cleaned out underbrush, constructed roads, and built campsites and other recreational facilities.

While the manpower provided by forestry camps today is substantially less than that made available by the CCC, the camps play a vital part in forest development and the creation and maintenance of recreational facilities. Much

(CONT. LAST PAGE)

WINTER SPORTING LIFE

To accommodate the growing demand for winter outdoor recreation the Department of Natural Resources now operates state forests and parks year round. Many of these areas offer excellent opportunities for snowmobiling, ice fishing, hunting and skiing. For the rugged individualist there is also winter camping (with self-contained units). Below is a list of some outstanding areas.

STATE LAND	LOCATION	ACTIVITIES
	BERKSHIRES	
Pittsfield S.F.	Pittsfield, via West St.	snowmobiling, skiing
Beartown S.F.	Monterey, Rte. 123 & Rte. 102, S. Lee	snowmobiling, winter camping
October Mt. S.F.	Lee & Lenox, Rte. 20 & 7	snowmobiling, ice fishing, hunting, winter camping
Greylock Mt. S.R.	Adams, Rte. 2, 7, 8	snowmobiling
Otis S.F.	Otis, Rte. 23	ice fishing
Savoy Mt.-Florida S.F.	Florida, Rte. 2 & Rte. 116, Savoy	ski touring
East Mt. S.F.	Great Barrington, Rte. 23	ski touring
Mohawk Trail S.F.	Charlemont, Rte. 2	winter camping
Granville S.F.	Granville, Rte. 57	winter camping
	CENTRAL MASSACHUSETTS	
Wells S.P.	Sturbridge, Rte. 20	winter camping
Rutland S.P.	Rutland, Rte. 122	ice fishing
Wachusett Mt. S.R.	Princeton, Rte. 31	skiing
Leominster S.F.	Fitchburg, Rte. 2 & 31	snowmobiling
Upton S.F.	Upton, Westborough Rd.	snowmobiling
Whitehall S.P.	Hopkinton, Rte. 135	ice fishing, snowmobiling
	PIONEER VALLEY	
Hawley S.F.	Hawley, Rte. 8A	snowmobiling
DAR S.F.	Goshen, Rte. 9	snowmobiling, ice fishing
Erving S.F.	Erving, Rte. 2	winter camping
Catamount S.F.	Colrain, Rte. 2 & 112	snowmobiling
Wendell S.F.	Wendell, Wendell Rd.	ice fishing
Brimfield S.F. (Dean Pd.)	Brimfield, Rte. 20	snowmobiling
	EASTERN MASSACHUSETTS	
Callahan S.P.	Framingham, Millwood St.	snowmobiling (during daylight hours only)
F. Gilbert Hills, S.F.	Foxboro, Rte. 1 & 140	snowmobiling
Freetown S.F.	Assonet, off Rte. 24 & 79	snowmobiling
Myles Standish S.F.	So. Carver, Rte. 3, 44, 58	snowmobiling, hunting, winter camping
R. C. Nickerson S.P.	Brewster, Rte. 6A	winter camping
Willowdale S.F.	Ipswich, Linebrook Rd.	snowmobiling
Bradley Palmer S.P.	Topsfield, Rte. 1	snowmobiling (during daylight hours only)
Salisbury Beach S.R.	Salisbury, Rte. 495, 95, 110, 1, 1A	winter camping, coastal fishing

LEGEND: S.F. — STATE FOREST
S.P. — STATE PARK
S.R. — STATE RESERVATION

Blackstone — The river's better portions are characterized as a nuisance, the remainder as a health hazard. Even more discouraging is the indifference among people in the basin to the need of cleaning up the river. Ironically, many still see the Blackstone's potential in industrial rather than recreational and aesthetic terms even though the textile mills, the largest industrial holding on the river, are closing down. Volumes of untreated wastes are being discharged into this natural low-flow river. Legal and political setbacks have delayed efforts to construct municipal and regional treatment plants. One bright ray in this environmental gloom is Worcester's readiness to begin construction of a $45 million treatment plant. Nevertheless, no timetable for reducing the river's pollution has been set.

THE CHARLES RIVER CORRIDOR PLAN

Commissioner Arthur W. Brownell announced recently that the Department of Natural Resources, in conjunction with the U.S. Army Corps of Engineers, plans to permanently protect and preserve open space for outdoor recreation and environmental enhancement in the Charles River Watershed. With the Metropolitan District Commission already controlling most of both banks of the lower Charles River, fulfillment of this plan would create a continuous corridor of protected land from Boston Harbor to Echo Lake in Milford and Hopkinton.

The plan calls for both private and public action to reserve some 22,000 acres of land in perpetuity for outdoor recreation and environmental conservation. The first phase — to be completed by 1975 — calls for preservation, by a variety of actions, of some 11,000 acres along a one-mile wide corridor, extending one-half mile on each side of the Charles River between Watertown Dam and Echo Lake.

Added to the 9,740 acres already under public or semipublic control in this stretch of the river, such action would permanently protect the entire length of the main stream, including all major bordering wetlands and headwaters slopes as well as selected portions of major tributaries.

The second phase — to be completed by 1985 — calls for protecting and preserving an additional 11,000 acres to secure spring-freshet storage locations off the river and to enlarge outdoor recreation capabilities in the Charles River Watershed beyond the corridor.

FORESTRY CAMPS: PRISONS WITHOUT BARS

In the wake of the bloody tragedy at Attica Correctional Facility last September the country has been forced to take a hard look at prison reform and the opportunities — or lack of them — for effective rehabilitation. In Massachusetts, as in most other states, the correctional system is beset by a host of problems: overcrowded living conditions, limited medical facilities except at the Norfolk Prison Colony, inadequate funds for vocational training and the hiring of qualified teachers and social workers, and, perhaps the major source of most of these troubles, public apathy to prison reform.

Yet amid the threatening chaos within the state's prison system some effective — though too few — rehabilitation programs stand out. Among them are halfway houses, such as Brooke House in Boston, which serve as short-term residential centers for former prisoners needing more time to adjust to the outside world; self-development programs run by inmates at Concord Reformatory and the Deer Island House of Correction; and, above all, forestry camps for prisoners. Operating on land owned by the Department of Natural Resources, these camps are jointly administered by DNR and the Department of Correction.

Forestry camps for prisoners were first pioneered in 1931. Wisconsin established camps as a temporary means of reducing overcrowded conditions in state prisons. But prison officials soon realized that the camps — with no walls, barred windows, watchtowers with heavily armed guards — had a positive effect on the inmates. Consequently Wisconsin made the camps a permanent part of its penal system. Shortly afterward California, Indiana, Michigan, Oregon and Ohio adopted similar forestry camp programs.

In 1951 Massachusetts passed a law specifying that forestry camps would be open to male prisoners not serving life sentences "who have shown by their conduct and disposition that they would be amenable to less rigorous discipline and would benefit from work in the open air." Three camps now function in the state.

The camp at Myles Standish State Forest in Plymouth opened in 1952 with twelve inmates from Charlestown State Prison which, for over seventy years, had been condemned as unfit for human habitation. In 1955 a second forestry camp was established at Monroe State Forest in the Berkshires and in 1964 a third camp was set up at Warwick State Forest in north central Massachusetts. So successful were these camps that similar camps were opened for juveniles. Today DNR, in conjunction with the Department of Youth Services, operates a forestry camp for wayward youths at Nickerson State Park in Brewster and plans to open another camp this year at Middlefield State Forest.

To gain public acceptance of the forestry camp program as well as to provide a conducive climate for rehabilitation, the legislature placed restrictions on the transfer of prison inmates to forestry camps. Lifers and sex offenders are excluded by law. The Department of Correction also screens applicants to weed out men with escape records, the physically handicapped, and malingerers. As an additional means of promoting public approval of the forestry camps the law requires that the Department of Natural Resources hold a public hearing "in a city or town situated within a radius of ten miles of the proposed site."

No court commits men to the forestry camps; all men accepted for camp duty are volunteers. But there is no problem filling openings. Three prisons — Norfolk (medium security), Concord (maximum security) and Walpole (maximum security) — tie into the forestry camps. Since their combined inmate population is about 2000 and the number of inmates at the three forestry camps is limited to 150, less than 10 percent of the inmates have a chance of being admitted to the camps.

Of the men selected most have good conduct records and six to eighteen months left to serve on their sentences. A dossier of an average camp inmate might read as follows: Age: 29-31; married with three or four dependents; education: less than ninth grade; backsays: "There are still so many unknowns — such as how much pollution will come from urban and rural runoffs and how effective the dam, pumping station, and detention and chlorination center will be in coping with sewage overflows and salt-water intrusions."

Whether or not an attempt is made to upgrade the basin to swimming water quality, the entire Charles River will not be cleaned up before 1976. And even if this is accomplished one wonders if the Charles will ever again approximate the "celestial hue" Longfellow eulogized.

MASSACHUSETTS RIVERS: PROGRESS REPORT

Over many decades the major rivers in Massachusetts became severely polluted. However, in recent years the state has established a strong pollution abatement program. Already substantial progress has been made in reducing our rivers' pollution with plans for much more to be done in the next few years. Below is a capsule report:

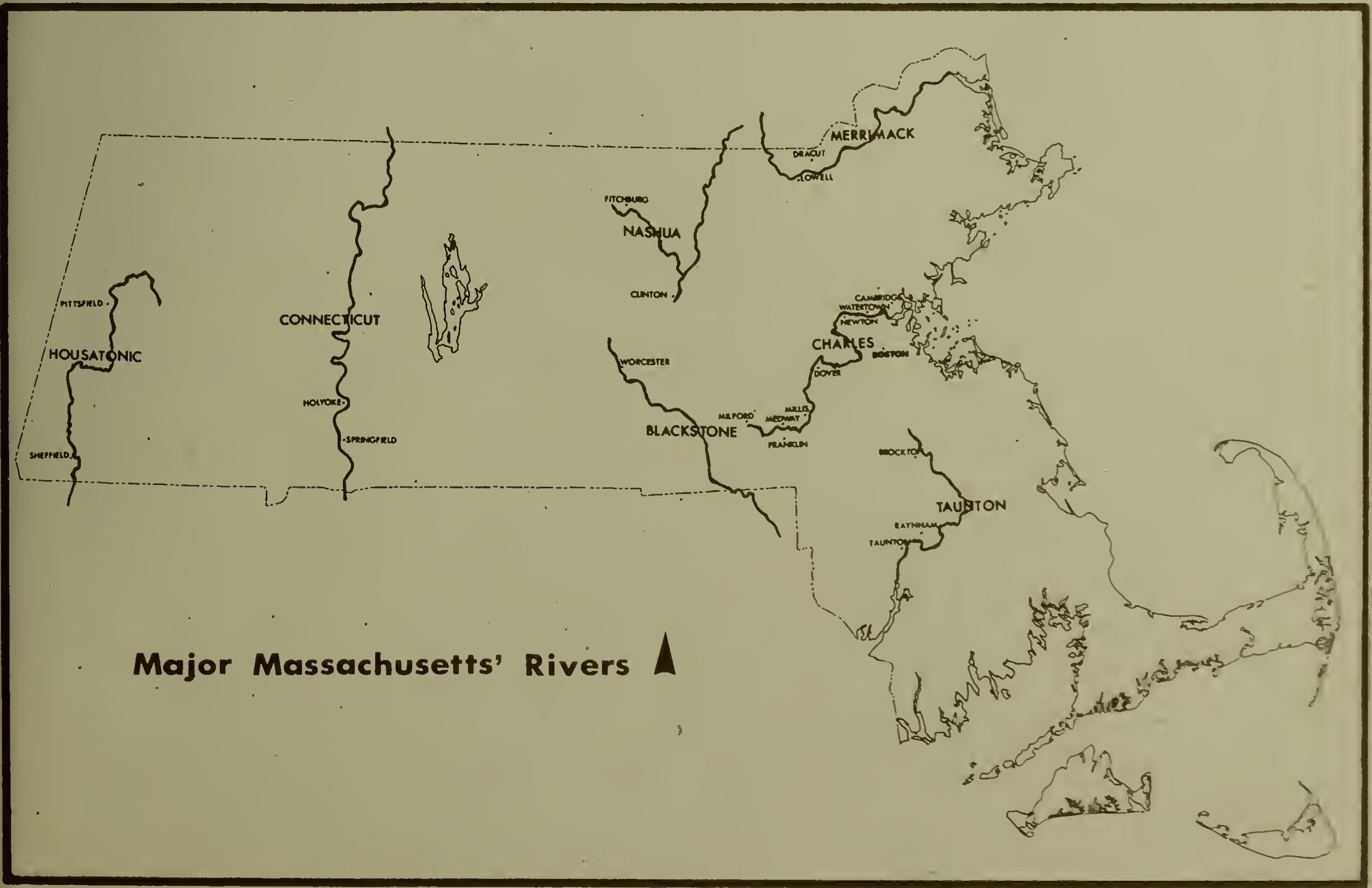
Merrimack — On both sides of the New Hampshire-Massachusetts line the river is polluted, mainly from raw municipal sewage and paper mill wastes. However, the biggest hurdle in the pollution battle, politics, has been cleared. Final plans are now being completed for construction of wastewater treatment facilities to serve Lowell, Dracut, Lawrence and Haverhill. Estimated cost of these projects: $100 million. By 1975 these plants should be in operation, making most of the river suitable for recreation, fishing and aesthetic enjoyment.

Nashua — Dubbed the state's most obscene river because of its globs of debris and sick milky-green color, the Nashua is also sometimes referred to as "the river you can walk across." Due to intensive industrial use the river has been severely polluted for years. Discharge of municipal wastes into this relatively low-flow river has aggravated the problem. However, the city of Fitchburg is ready to start construction on two municipal-industrial waste treatment facilities at a cost of $30 million. Completion of this facility, scheduled for late 1973, along with other smaller facilities, will enable major restoration of the river.

Housatonic — Good progress has already been made in abating pollution. General Electric has cleaned up most of its industrial wastes, and the city of Pittsfield is actually four years ahead of schedule in construction of sewage treatment facilities. By next summer the entire river should show marked improvement. Above Pittsfield, and in the Sheffield stretch, the water will be suitable for swimming.

Connecticut — Much of the state's largest river is relatively clean. But severe pollution problems exist in the lower Connecticut Valley in the Holyoke-Springfield area. Pollution comes chiefly from human and industrial wastes and thermal discharges from power plants. One of the largest treatment facilities in the state is slated for Springfield and other municipalities on the Connecticut and its tributaries. But due to the size and complexity of this project, completion is not scheduled until 1976. Then look for fantastic improvement.

Taunton — A tale of two river segments. Great progress has been made in the upper portion. Brockton has completed a secondary treatment plant and planning is moving forward on several regional wastewater treatment plants to handle sewage from communities above Taunton. By 1975 the upper portion should be vastly improved. But the river basin—from Taunton to Mt. Hope Bay—is another story. There the river is polluted by raw sewage and such toxic discharges as mercury, paint and dyes. Fish kills occur in Mt. Hope Bay from thermal pollution. Studies on the tidal estuary below Taunton are now being conducted which should provide the basis for elimination of sewage and industrial wastes in this section of the river. But nobody is predicting when pollution in the lower portion will be reduced.



Major Massachusetts' Rivers

FORESTRY CAMPS

(CONTINUED)

of the work done in recent years would not have been accomplished at all without forestry camp assistance. From their base camp at Monroe work crews have constructed campsites at Mohawk Trail State Forest and Savoy Mountain State Forest in North Adams; they have also built miles of hiking, bridal and snowmobile trails. From the Warwick camp crews have performed a variety of services ranging from building picnic tables for Erving and Mt. Grace state forests to maintaining DNR swimming pool grounds in Holyoke and Westfield. On Cape Cod Plymouth inmate crews, led by DNR personnel, have battled forest fires with almost legendary heroism.

Presently fifteen inmates from Myles Standish are working full time at F. Gibert Hills State Forest in Foxborough constructing a headquarters building, rest rooms and snowmobile trails worth over $100,000 in labor and materials. But with camp labor the cost to the Department of Natural Resources will be only $40,000. Last year use of forestry camp labor to improve and maintain recreational facilities saved the Commonwealth over $340,000. The cumulative value to the state of the nineteen-year forestry camp program has been $6 million. It costs approximately $4800 a year to keep a man in a maximum or medium security prison and only about $1600 per year to maintain him in a minimum security forestry camp — a saving to the state of $3200 per camp inmate.

But the prisoner's input is much more than monetary. As Bruce S. Gullion, Director of the Division of Forests and Parks, expresses it: "Without these crews we just would not have the manpower available to get these jobs of forest development and recreational improvement accomplished."

Unfortunately, there are not enough forestry camps. Nor has there been the impetus in the past to expand the number. The public has supported camps in principle, but whenever plans to locate a camp were drawn up communities in the area protested that their citizens would be unsafe and their property values would decline. Although the reverse has proven to be true in areas where camps are now located, these objections continue to impede the expansion of the forestry camp program. Perhaps now, in the light of events at Attica and of conditions which prevail throughout our entire penal system, the time is ripe to reconsider the merits of expanding the forestry camp system, not only as an effective climate for rehabilitation but also as a means of providing essential services for the Commonwealth.

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ON THE DOCKET

The following are major environmental bills either passed into law (**P**) or defeated (**D**) in the Massachusetts legislature this year.

MASSACHUSETTS ENVIRONMENTAL POLICY ACT (H6385) — Filed by Governor Sargent, the bill seeks to insure that no major state project significantly affecting the environment will be undertaken until full disclosure of the environmental effects of the project are reviewed. **D**

SOUTH CAPE BEACH BILL (H1575) — Calls for DNR to purchase South Cape Beach in Mashpee, the last warm-water beach on the south shore of Cape Cod. **P**

WETLANDS PRESERVATION BILL (Chapter 839, Acts of 1971) — Authorizes $5 million for the Division of Fisheries and Game to purchase wetlands throughout the state. The bill would help to permanently preserve wetlands through outright acquisition. **P**

PHOSPHATE BILL (H5145) — Calls for ban throughout state on sale of many detergents containing phosphates. While not a complete ban (some phosphates would be permitted), bill would affect about half the detergent manufacturers selling in the state. **D**

CITIZENS' RIGHTS OF ACTION BILL (Chap. 732) — Enables individuals to take to court polluters who are violating existing antipollution laws. **P**

SCENIC RIVERS BILL (Chap. 840) — Empowers DNR to act to preserve portions of rivers classified as scenic, recreation or wild river areas. **P**

SCENIC TRAILS BILL (H5372) — Calls for the Public Access Board to establish and coordinate plans for a system of recreation and scenic trails throughout the Commonwealth. Under this law state agencies, counties and local governments would have to consider trail systems in any highway or utility corridor proposal. **D**

MINERAL RESOURCE BILL (Chap. 567) — Designed to conserve mineral resources off the Commonwealth's coast, the bill places a moratorium on all marine mining until such time as DNR obtains information on the quantity and quality of mineral resources available and the ecological implications of marine mining. **P**

EXTENDED FISHERIES JURISDICTION BILL (H5982) — Emergency law extending state's control over waters as far as 200 miles off the Massachusetts coast. Purpose of bill is to provide management of marine resources that are now being overfished, thereby preventing further depletion of valuable commercial fish stocks. **P**

WETMORE BILL (Chap. 876) — Named after its sponsor, Rep. Robert Wetmore, the law prohibits the sale in Massachusetts of any product made from hides of endangered species, such as spotted cats and alligators. **P**